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are still improving with ever-increasing rapidity. And yet man as an *individual* is deteriorating, not in spite of, but in consequence of, these prodigious ameliorations in his condition.

Multiplying and magnifying the means of improvement and enjoyment, without at the same time correspondingly lengthening the term of life and enlarging the receptive capacity, offer but one advantage, that of *choice*; and this very advantage has the effect of increasing the tendency to specialization, which is only another name for narrowness. It does not swell the man into a larger sphere, but simply sharpens him to a finer point.

The world has already made too much history and eminent biography. The broadest mind, the most tenacious memory, can comprehend but the barest outlines, and for adequate study must content itself with fragments. The same applies to science, art, everything. Hence everywhere the race of man is told off into details. The intellectual class divides up its domain into lots, and assigns them to its settlers, as the United States Government assigns its territorial freeholds. The sky is partitioned off among astronomers like so much Western territory. In philology one man devotes his life to the third declension of one language, and at the end laments that he "has not confined himself to the dative case."

In the arts it is still worse. Time was when one man made a watch. Now he makes only one small part of it. As a result the product is greatly improved, but the *producer* is deteriorated in still greater degree.

Enlarging the scope of action in all directions, when the scope was already too large, has very much the same effect that enlarging the earth itself would have—it proportionately diminishes the individual actor.

When, countless æons hence, Jupiter and Saturn shall be inhabited, the Jovian and the Saturnian man will be as much smaller than the terrestrial man as those giant plants are greater than the earth. Not so, however, with the Jovian and the Saturnian races. For our hundreds they will number their tens of thousands. The amœboid cells which make up the body of a frog are larger than those of a man, and each may be capable of a greater diversity of action; but compare the resultants of their coördinated action!

Shall we lament the specialization and consequent deterioration of the individual man, which thus results in the higher differentiation and finer organization of the race as a whole? or shall we school ourselves to that philanthropy which can rejoice, not in the glory of a man, but of mankind?

This is the ideal philanthropy. The truly great philanthropist is as careless of the single life as nature herself where the welfare of the race is concerned. Who are the "unborn millions" for the sake of whom we give our lives by the thousands on the battlefield? We do not think of them individually. They are only the living, coördinated cells of a vast living, breathing organism whose name is Posterity. And when the health of that great Being is imperilled, we do not hesitate to be cut off and thrown away any more than the cellular fibres of our arm would rebel at the surgeon's knife. A man is a little thing, but "many a mickle maks a muckle."

EDWARD P. JACKSON.

NO STARVATION IN RUSSIA.

ON MY arrival in this country I find your journals discussing with much ability and natural fervor the brilliant prospect of a great influx of European gold into America to result from the enormous demand which Europe is ex-

pected to make upon the splendid harvests of your great West. I am not a merchant, and I do not pretend to know how large is the normal demand made by Europe upon your American grain fields. But I have passed very recently through the southern and western provinces of the Russian Empire, through Germany, through eastern France, and through Great Britain, on my way from the Caucasus to the United States. I have been told that the actual results of the harvest of 1891 in Germany, in eastern France, and in Great Britain are much better than were anticipated in the summer, and that no fear exists in any of those countries of an unusual dearth of cereal products. And I read with amazement that what is true of western Europe is not true of Russia. I read that the people are actually starving throughout a great part of the European dominions of the Czar; that the officers of the Russian army and the Russian nobility are retrenching their usual expenditure in order to avert a general famine, and even that the government of my country has forbidden the conservation of any grain for the sowing of next year's crops! If I did not know that three-fourths of the Continental press are now controlled by the Jews, and that the Jews are in possession of the great news agencies such as Wolff's and Reuter's, all this would astonish me indeed!

There are more than two million square miles of territory in European Russia inhabited by more than ninety millions of loyal subjects of the Czar. Out of this enormous area the crops of 1891 are bad in five *oblasts*, or provinces, to my knowledge, comprising less than 90,000 square miles, and inhabited by about eight millions of people. This means absolute distress in certain restricted regions. It means no more. There are districts of Ireland in which the potato crop is defective this year. There is a territory covering two million acres, called Oklahoma, I read, in your own great country, where there are no crops, and where human beings are dying of starvation. But Ireland is not famine-stricken in 1891, nor are the United States, nor is the Russian Empire. The ukase of the Czar forbidding the exportation of rye and oats has been made a pretext for this monstrous story. That ukase was issued for military reasons, not economical reasons. Since August 1 more than 300,000 Russian troops—a majority of them Cossack cavalry and light troops—have been moved into southwestern Russia from the East. There are now 640,000 troops of all arms established for precautionary and disciplinary purposes between Odessa and the Pruth and Warsaw. To secure the comfort and efficiency of this vast body of troops, the Russian Government gave orders months ago for the concentration in these provinces of adequate supplies of grain of the necessary kinds; and as it was notorious that the Jew grain-brokers always try to raise the domestic price, especially to the government, of grain, when they scent an unusual demand by forced exportations, the ukase forbidding such exportations was suggested by the able Imperial Finance Minister Vischnegradsky, approved by the Czar, and issued. I have seen the good effects of it in the healthy and vigorous appearance of the men and the horses of the forces under General Vladimiroff and General Grodno at every point of my recent journey. Disappointed of their profits in Russia, the Jews are perhaps now speculating in America on the effect of these tales of a great European famine and consequent great demand for American grain. I rejoice that you have so noble a harvest. I hope you will have a wide and remunerative sale for its golden treasures. But if the Germans and the Austrians who are now encouraging disloyalty in the cities of Poland count

upon a famine in Russia to weaken the arm of the empire, they count without their host.

SERGIUS V.

THE COMING GLACIAL AGE.

WHEN men are told that by far the stronger probability is that countless ages hence the solar system will be frozen to death than that it will be burned to death, their gaze is immediately turned groundward again. "After us the deluge," and that is long, long after the deluge.

Our pity for the woes of remote posterity is, if possible, feebler and more vague than that we feel for those who suffered in the remote past. The smallest members of the solar system, the moons, have already suffered glacial death. Can we shiver in sympathy with the last lunar equatorial inhabitants who may have held up their icy hands imploringly to the sun? As from cycle to cycle the sun shrinks more and more, and thus expends his vast stores of latent energy, planet after planet will succumb, we are told, until, last of all, the sun himself will go out in the blackness of darkness forever.

Forever? Then what will become of the enormous amount of expended energy? Speculative science has thus far offered no satisfactory answer to the question. The indestructibility of energy is a law of physics as well established as that of the indestructibility of matter. "Radiated into space" is no adequate explanation. Empty space, or, rather, the ethereal *plenum*, which is the only thinkable environment of masses of matter lighting and heating one another, held together by mutual gravitation, cannot retain within itself the smallest tremor of the energy it transmits, or else the most powerful telescope could never reveal to us the trembling ray that has been millions of years on its journey. The explanation that it is "dissipated and rendered unavailable in the form of heat"—in other words that all "strain and stress are relieved and equilibrium established"—is scarcely more satisfying. Its apparent fallacy may, perhaps, be made plain by a somewhat "violent" hypothesis. *Disce omnia ex uno.*

Let the whole universe be represented by two atoms, which we will suppose to be placed originally (say) one millimetre apart. Then the force of their mutual gravitation multiplied by one millimetre may represent the total potential energy of the universe at the beginning of the processes now going on. In obedience to their mutual attraction, they move toward one another with accelerating velocity. This motion may stand for all the phenomena which have occurred since the beginning; otherwise, for the conversion of the potential energy of the universe to kinetic energy. Finally, at their maximum velocity, the two atoms come into contact. This, of course, represents the period when the condensation of matter shall have reached its maximum, when all latent energy shall have been expended and "radiated into space." But will the two atoms remain in contact? No; by the inevitable law of dynamics they will rebound and return to their original positions, when the process will be repeated, and so on *ad infinitum*.

If two atoms would act thus, so would four atoms; so would millions. Why not the universe itself? What is the true meaning of the term "unavailable energy"? What would correspond to it in the position or movements of the pair of atoms supposed?

WALTER J. GRACE.